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(21) International Application Number: PCT/CA99/00163 (22) International Filing Date: 1 March 1999 (01.03.99) (30) Priority Data: 2,224,750 2 March 1998 (02.03.98) CA (71)(72) Applicant and Inventor: PACK, Gordon, Shane [CA/CA]; 10681 - Cottonwood Crescent, Dawson Creek, British Columbia V1G 4M3 (CA).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: HOCKEY TARGET CAGE (57) Abstract A hockey game cage consisting of two surfaces sloped towards the middle so hockey pucks will slide down or balls will roll into a bottom guide which flips the pucks over on their edges allowing them to roll. The pucks or balls roll down the bottom guide which is sloped towards the front of the game and are carried up a guide by a belt which has forks protruding from it. The forks carry the puck up an elevation guide and drop it into a top guide which is sloped to the back. The pucks or balls roll down the top guide back to the shooting surface. The top guide has a crossover to allow the pucks or balls to either go on a left or right shooting surface. The pucks or balls are shot at targets which are placed in a hockey net at the front end of the unit. As the pucks or balls pass through the targets they will activate switches that will detect their presence and calculate the appropriate score.		

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HOCKEY TARGET CAGE

Description

This invention relates to a hockey target game using pucks or balls. Where an individual shoots at the targets and the pucks or balls are returned back to the shooting surface.

This invention provides a neat, tidy and safe area for doing this type of activity. It will also save the user from having to go and retrieve hockey pucks that have already been shot.

Everything that is needed will be stored within the invention. It will be completely enclosed with plastic, plexi-glass, or netting (hockey net material).

This invention can be used in a number of different ways and will be modified to meet any particular demand.

Examples:

The basic model would allow a person to use it for perfecting their own skills at shooting pucks with accuracy – as a practicing tool.

It could also be used in a game format, where the player can score points for hitting certain targets.

It may also be modified to have two or more players going against each other as opponents.

These are just a few ways in which this invention can be used. The possibilities are numerous.

Specifics:

Players go up the steps to the playing surface. The player picks whether he will shoot right or left handed by pushing a switch (E1), which goes to a solenoid (E2), which activates the puck direction switch on the top roller. Once the switch hits its limits (E3), the solenoid (E4) that

activates the puck release opens delivering a given amount of pucks. When the light sensor (E5), picks up that all the pucks have left, solenoid (E4) closes the chamber back up. Once solenoid (E4) closes, solenoid (E6) opens allowing pucks to roll up to solenoid (E4). Light sensor (E5) picks up that the pucks have returned, closing off solenoid (E6). Switch (E1) also turns drive motor (E7) on. When it hasn't been pushed for a certain amount of time, all electric power is shut off to the machine.

Now the player has a given number of pucks. He shoots the pucks off of either side C or D which is covered with artificial ice and pop-riveted to the frame. If the player misses the targets (J), on the hockey goal (K), the puck slides down the sloped floor (E) and into the bottom roller guide (F). The puck then rolls down to the lifting chain @, which is driven by the drive motor (E7) and is supported at the top by sprocket (N). One of the forks on the chain grabs the puck pulling it up guide (P). When the puck gets to the top, it rolls off of the fork and down guide (Q).

If the player puts the puck in the target (J), the puck hits the back of the target guide (O), and slides down the appropriate chute, hitting the appropriate switch giving him/her a certain score for the target that was hit.

The puck continues down the guides in (O) and down to (F), continuing back to the shooting surface.

As To All Prints:

- A steps
- B standing surface
- C lefthand shooting surface
- D righthand shooting surface
- E sloped floor
- F bottom roller guide
- G goal posts
- H maintenance area
- I sprocket and electric motor
- J targets inside the goalposts
- K goal area
- M main base frame
- N elevation sprocket
- O rear target guide
- P elevation guide
- Q top roller guide
- R elevation chain
- S top rail support guide

Fig. 1- Front View

Fig. 2- Top View

Fig. 3- Side View

Fig. 4- Main Frame – Strut made from 2" square tubing welded where all beams meet main frame rails; 2" x ¼" angle iron supports for the sloped floor are welded to B3, B4, B5.

- Fig.4A- Top supports for target guide (O), braces bolt to the top of strut and over the top of (O); struts welded here to bolt motor bracket (I).
- Fig.4B- Main Frame: The main frame is made out of 4" channel iron.
- Fig.4C- 2" angle iron frame made to rivet plywood and artificial ice to, is welded to the struts on B1 B2 B3.
- Fig.4D- Sloped floor frames, made from 1" angle iron, ¼" sheets of plastic are riveted to the frame, the frame is welded to the supports on the main frame.
- Fig.5- (Q) Top Rail Guide
(S)- Bottom six inches of this side is cut out so the hockey pucks can fall to the shooting surface. The bottom of this is welded to the base frame to support the ends of the top rail.
- Fig.5A- Top Rail supports are made of two- inch pipe. These are welded to top rail and the base frame. Wire Fence meshing or similar material is wrapped and tied to these to hold pucks in playing area.
- Fig.6- Guide (O), is 6" deep and fits inside (G). A cover plate is bolted to the back.

Fig.6A- Pucks slide down guides in (O) and fall into (F).

Targets (J) are cut out of 1"x 1/4" wall pipe. They are cut 4" long. The pieces are welded to the outside face of (O). The 4 corner targets are bolted flush to the goalposts. (O) is bolted to the angle iron floor support at the end of the sloped floor.

A black cover is bolted to (O) to enclose it. The back cover has a hole cut to unjam any hockey pucks.

Fig.7- A B C; (N) pillow block, shaft and sprocket is bolted to angle iron that is welded to (Q).

(I) is made of two plates welded together at 90 degrees. The electric motor is bolted to the horizontal piece and the vertical piece is bolted to a plate which is welded to the main base frame. The holes in (I) are slotted to adjust clearance and tension.

(Q) and (P) are made from 2"x 4" square tubing.

(Q) and (P) are put together with angle iron brackets welded to their ends which are bolted together. The top and bottom are cut out of (Q) where (Q) and (P) meet. The back of (P) is completely removed to allow the chain forks inside.

Fig.8-8A- Braces hold 4 pieces of 3"x 1/8" inch r and one 1/2" piece on the bottom to allow debris to fall out.

Fig. 9- the end of (F) is angled $\frac{1}{2}$ " per foot and the end brace has holes so it can be bolted to the angle irons that are welded on the sides of (P).

Fig. 9A- Bottom is cut out of elevation guide to allow the puck inside.

Fig. 10-10A-10B-

1/8" plate : which E2 and the return spring are connected to.

1/8" plates welded to (Q) to support it at the direction switch.

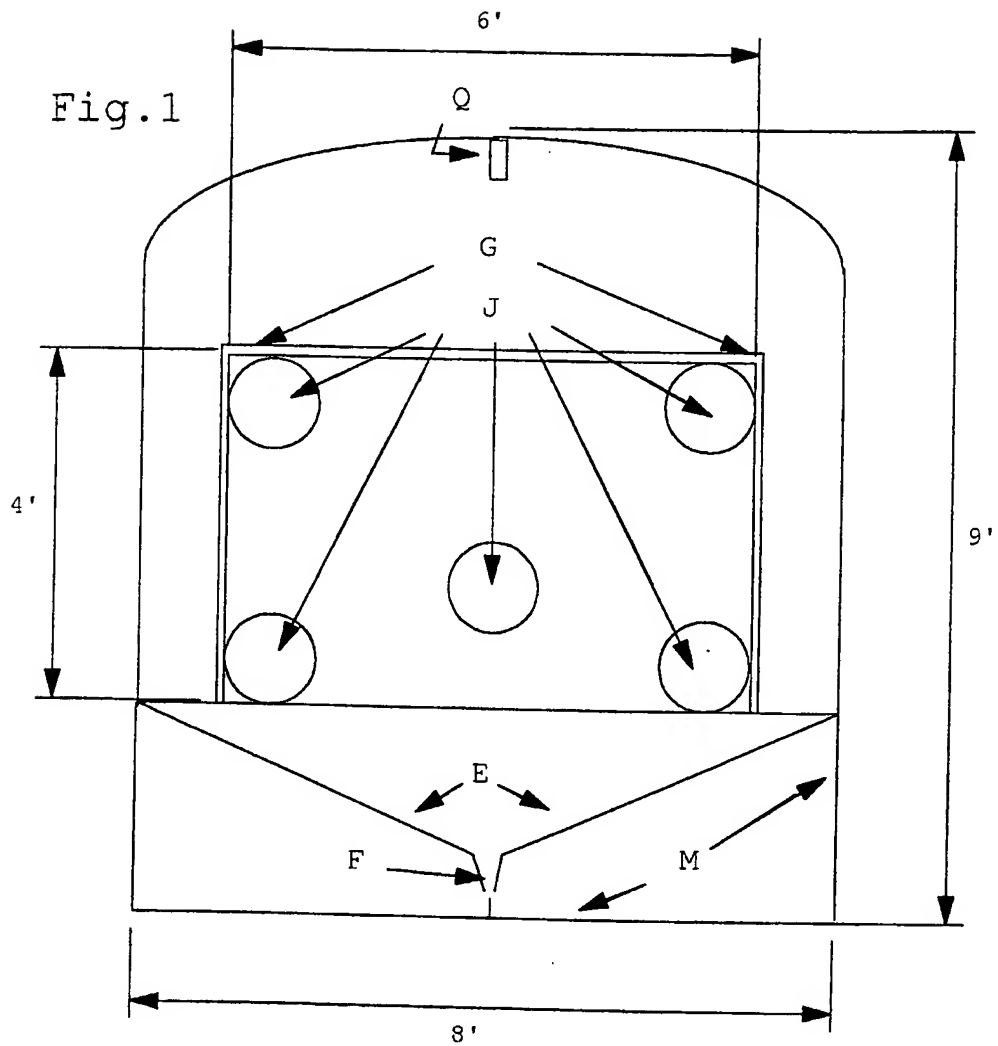
E3 mounted to a plate that is welded to the support plate.

Fig. 11-11A- Components are mounted to angle iron, which is welded to the side of (Q). Holes are drilled through (Q) for the plungers and light to pass through.

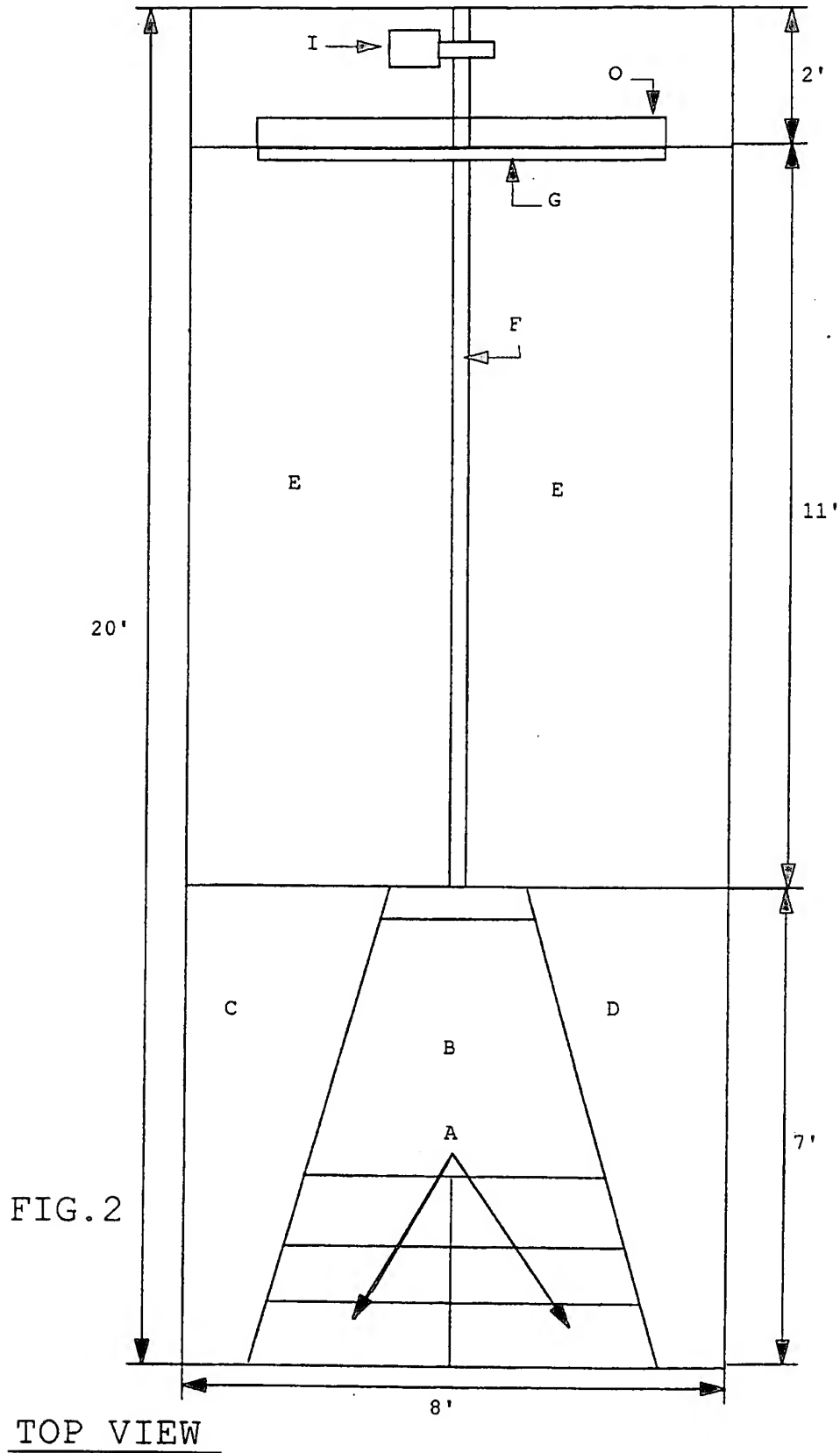
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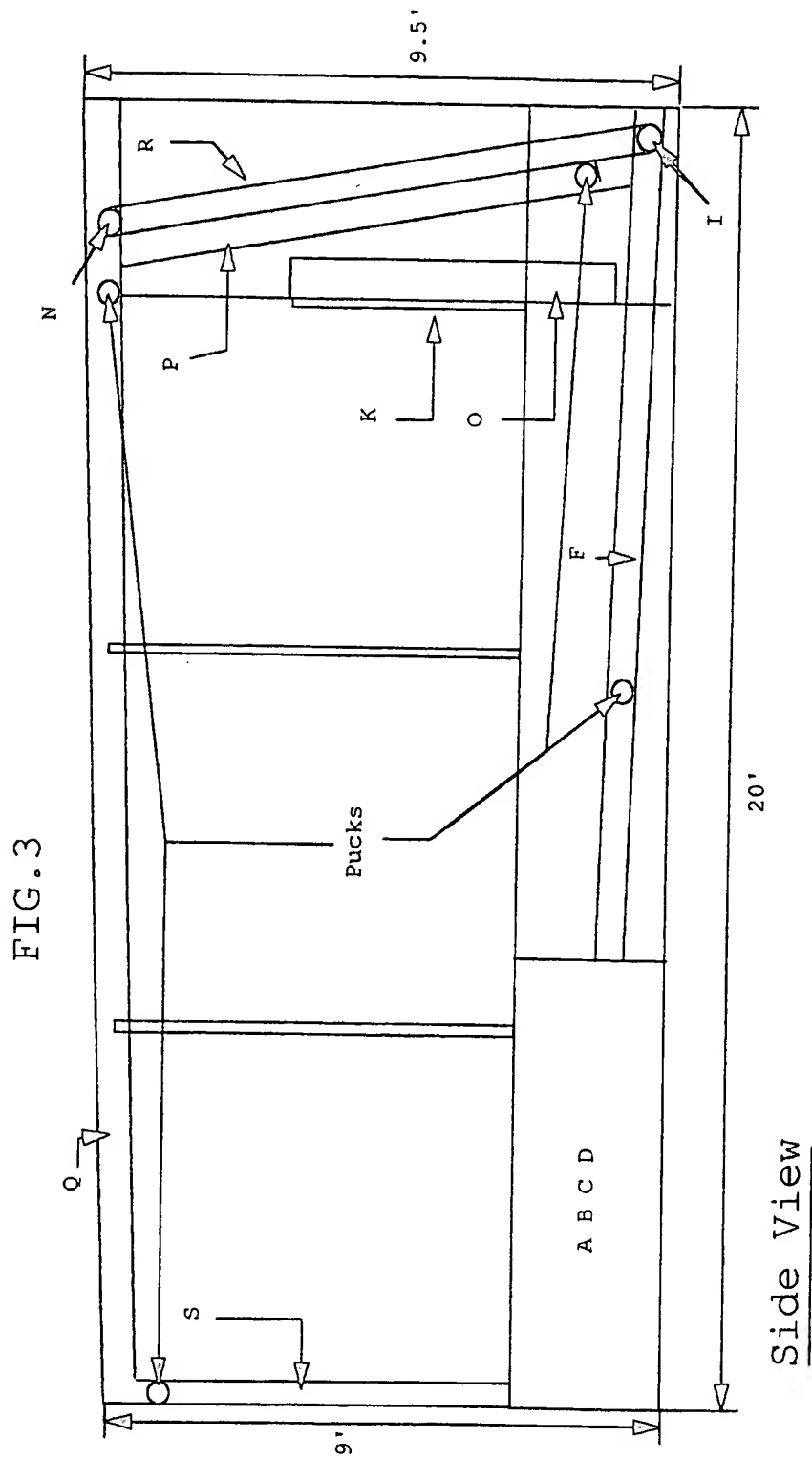
1. Two sloped decks with enough pitch to allow the pucks to slide, or balls to roll, towards the middle.
2. A space between the two sloped decks to allow a sliding puck, or a rolling ball through.
3. A bottom roller guide which is placed directly beneath the space in the sloped decks.
4. A bottom roller guide specially designed to take a puck which falls through the space in the sloped decks and turn it on its edge enabling it to roll.
5. The bottom roller guide has a space between the middle runner and two bottom side walls to allow any debris which falls in it to fall through.
6. The bottom roller guide is sloped towards the front wall allowing the puck to roll in that direction.
7. An elevation guide which has a hole cut out of the bottom just big enough to receive the rolling puck or ball.
8. A chain or belt, which is driven by a motor, has forks protruding into the elevation guide, which carries the pucks or balls to the top of the elevation guide.
9. An elevation guide which guides the pucks or balls up to the top rail.
10. A slot in the elevation guide is cut out to allow the forks on the belt or chain to protrude inside.
11. The elevation guide is bolted to the end of the bottom roller guide and the beginning of the top rail.
12. The top rail is made of either 3" pipe for balls or 2"x 4" rectangular tubing to accommodate pucks.
13. The top rail is sloped towards the back allowing pucks to roll in that direction.

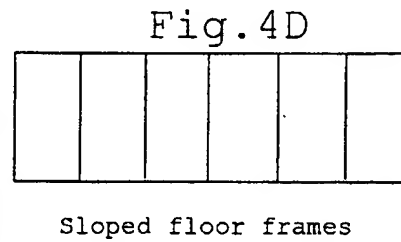
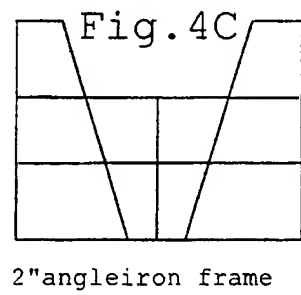
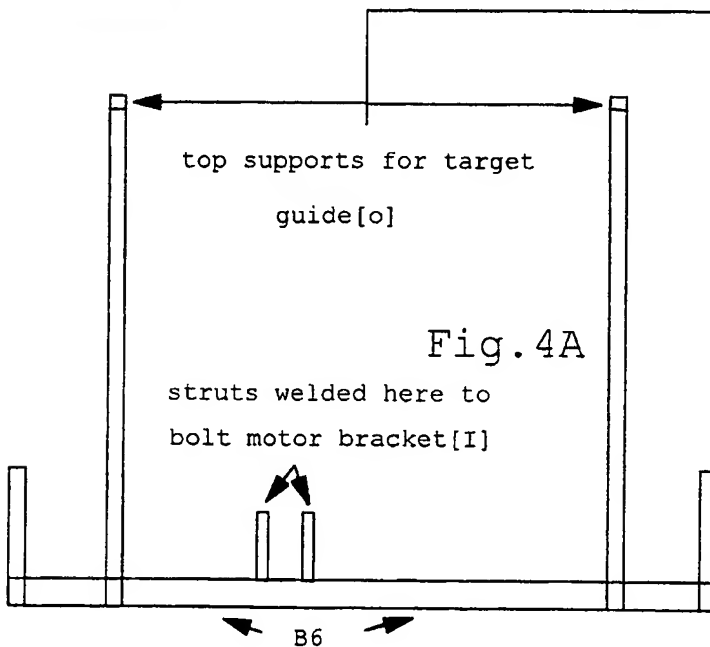
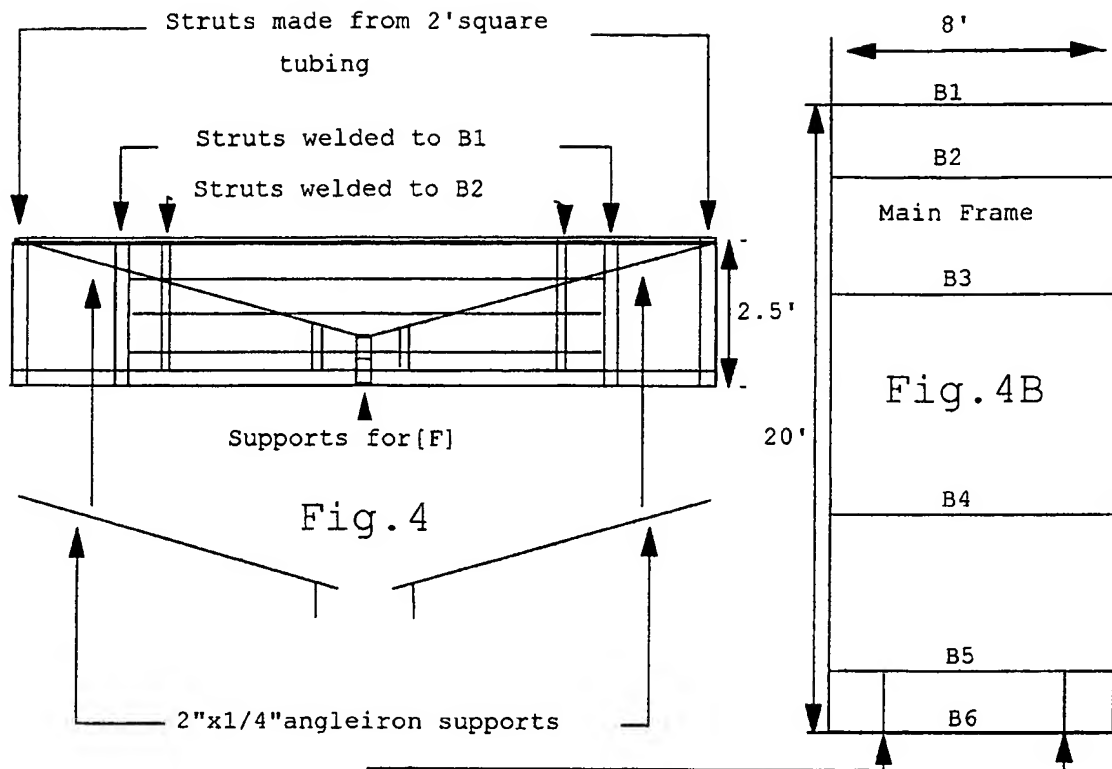
14. The top rail is made into a 'Y' with one arm going to the left back corner and the other to the right back corner.
15. At the beginning of the arms, a six-inch void is cut out and spanned with flatbar to hold the top rail together.
16. A cross over switch is put in the void to allow either the balls or pucks to go left or right down the top rail and on to the shooting surface.
17. An electrical relay with plunger moves crossover switch to the right and a return spring affixed to the crossover switch and top rail brings the crossover switch back to the left side.
18. Two relay switches placed in the top rail at 3" increments actuate transversely to each other to allow a given number of pucks or balls to roll down to the shooting surface.
19. A standing area in the middle with a shooting surface on either left or right side.
20. A completely enclosed cage to hold all the pucks or balls within the system.
21. A goal net frame with round targets on each corner and one in the middle approximately 1 ½ ft. up from the base.
22. A score board above goal net.
23. Readout above the score board that clocks the speed of puck or ball via radar gun.



Front View







MAIN FRAME

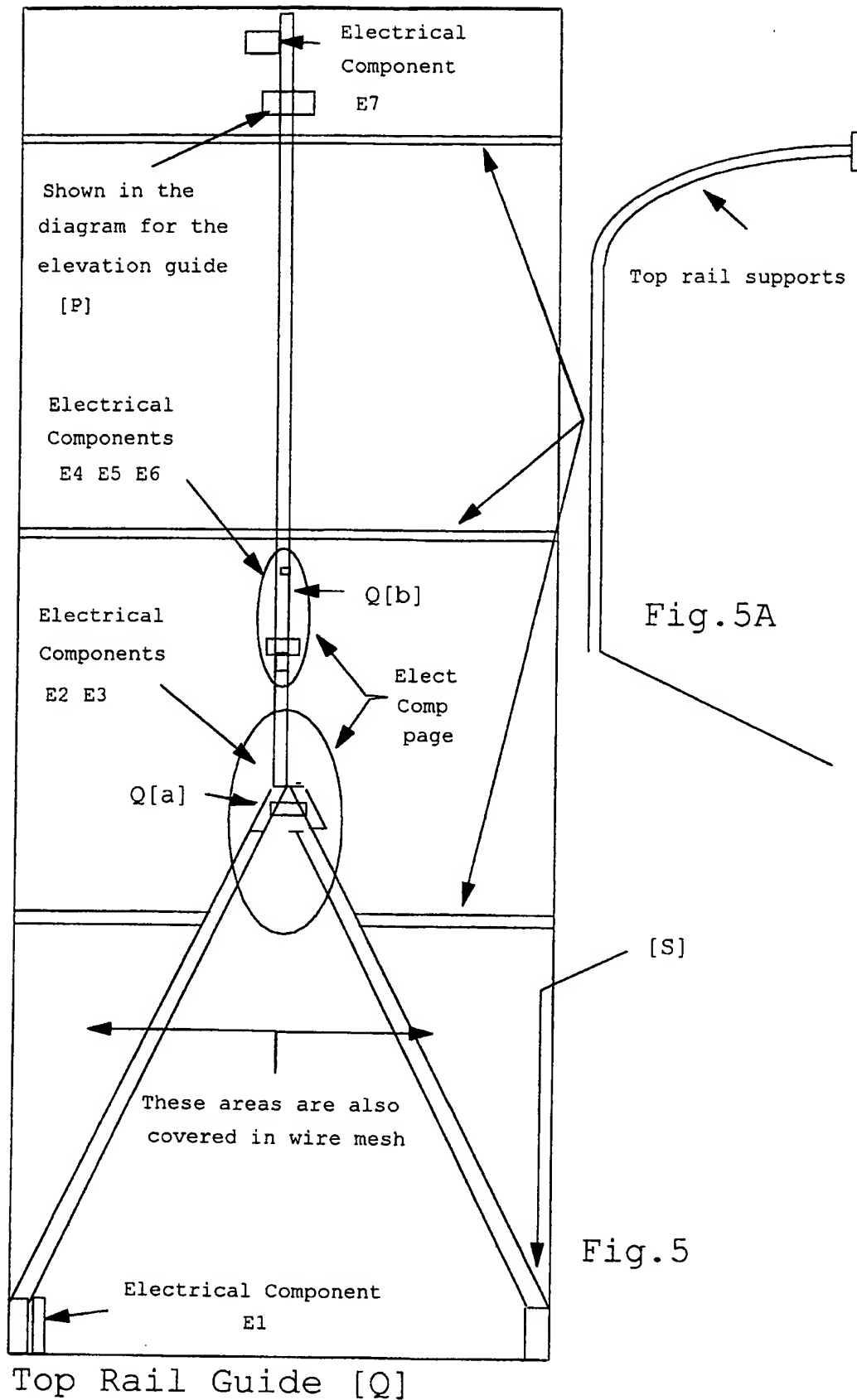
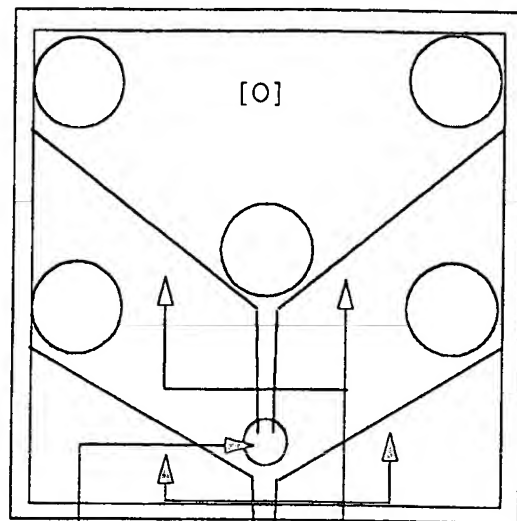


Fig. 6



hole in back
cover

Pucks

6" flatbar welded
inside as puck
guides

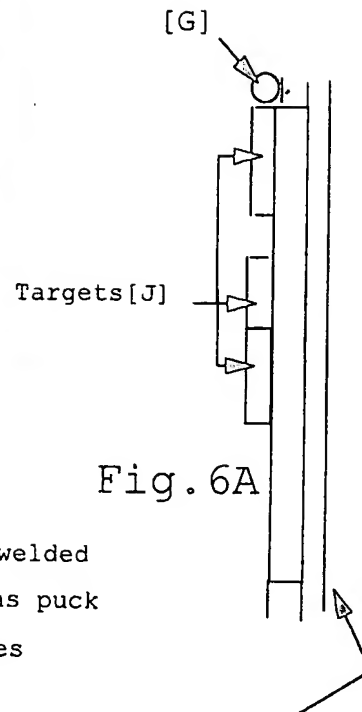


Fig. 6A

A back cover is bolted
to [O]

Fig. 8

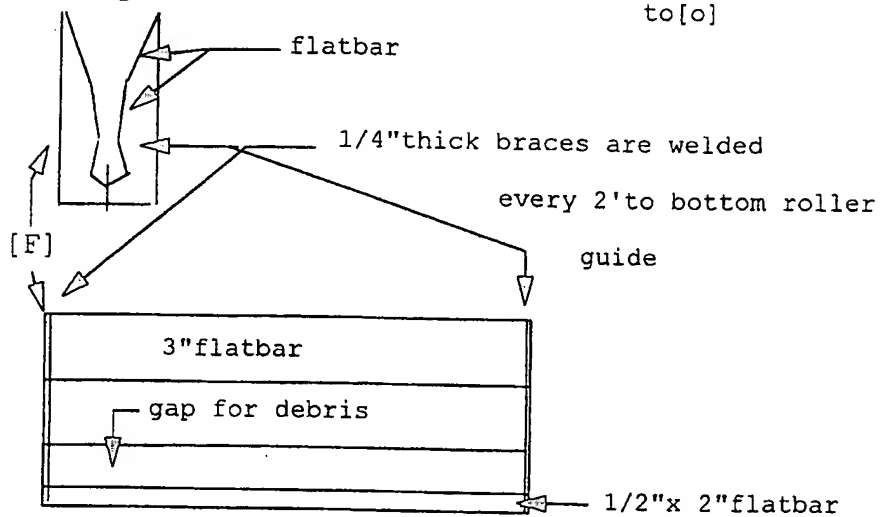
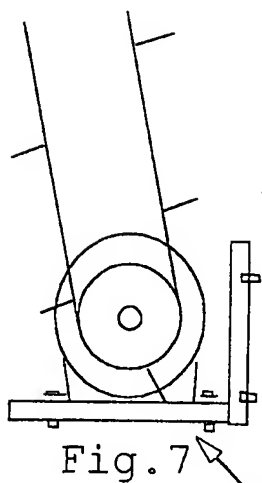
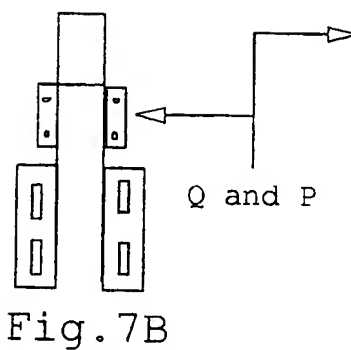
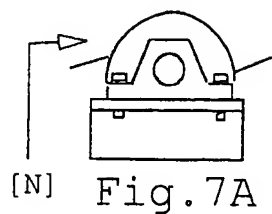


Fig. 8A

Guides



[I]

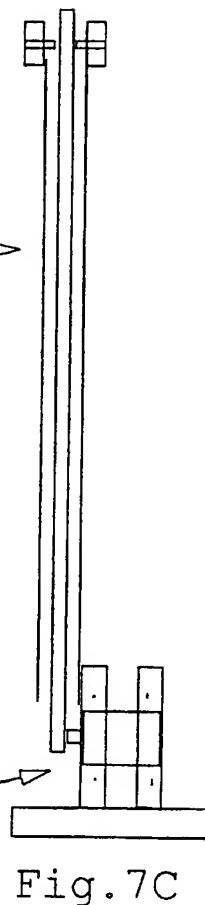


Fig. 9A tapered to ease pucks in

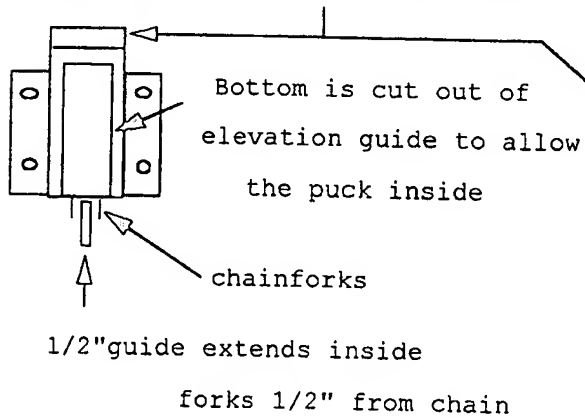
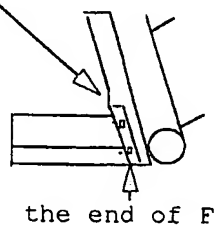
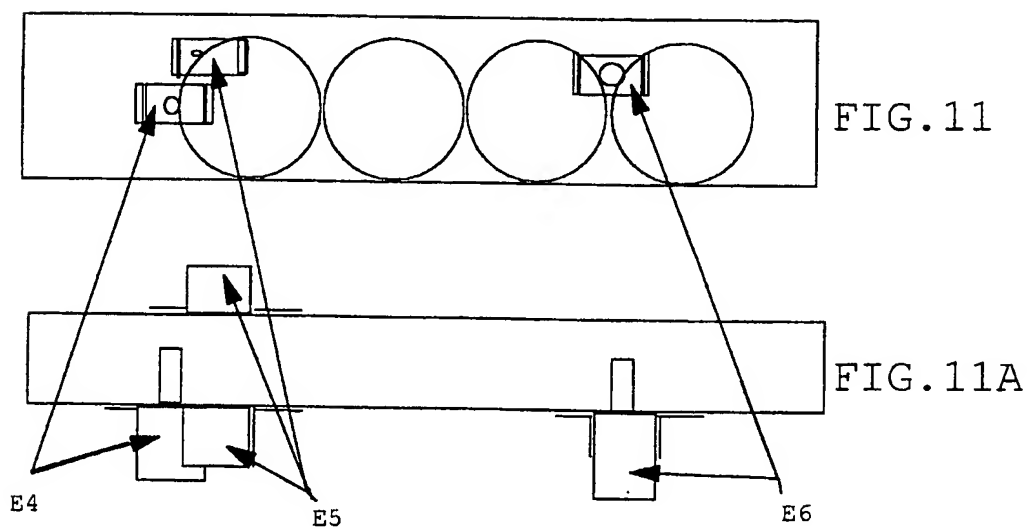
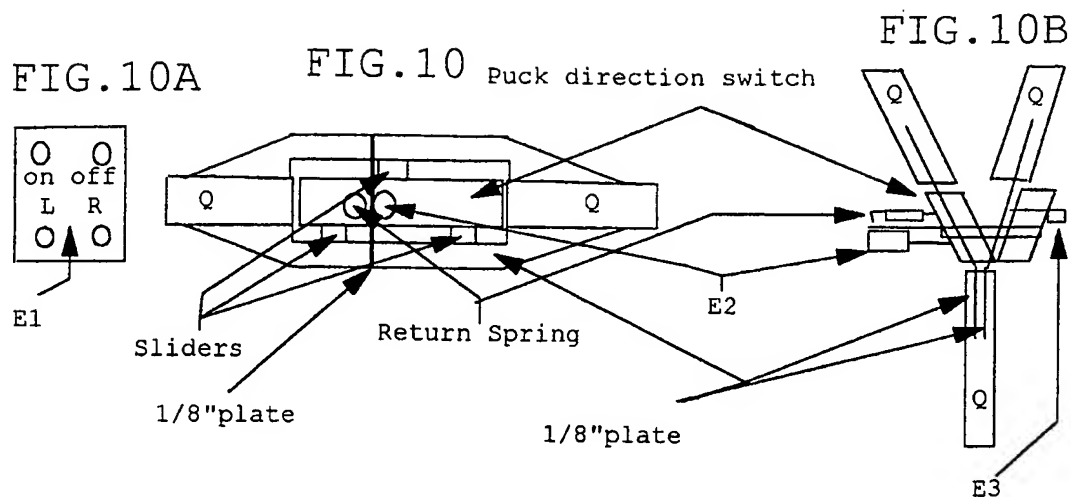


Fig. 9



Guides



ELECTRICAL
COMPONENTS

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 99/00163

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A63B47/00 A63B47/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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